We claim:

1. A composition for lowering the expression of the LIPG gene in a patient comprising an antisense nucleic acid.

2. The composition of Claim 1 comprising an expression vector which includes said antisense nucleic acid..

3. The composition of Claim 2 wherein said expression vector is selected from the group consisting of retroviral vectors, adenoviral vectors, adeno-associated viral vectors, herpesviral vectors, and naked DNA vectors.

4. The composition of Claim 1 wherein said composition is a synthetic antisense nucleic acid.

5. The composition of Claim 4 wherein said antisense nucleic acid is an oligonucleotide.

6. The composition of Claim 5 wherein said oligonucleotide contains chemically modified bases.

7. A composition for lowering the enzymatic activity of the LIPG polypeptide in a patient comprising a neutralizing antibody capable of binding to the LIPG polypeptide and lowering its enzymatic activity.

8. The composition of Claim 7 comprising an expression vector including a DNA sequence encoding said antibody.

9. The composition of Claim 8 wherein said expression vector is selected from the group consisting of retroviral vectors, adenoviral vectors, adeno-associated viral vectors, herpesviral vectors, and naked DNA vectors.

10. A composition for lowering the enzymatic activity of the LIPG polypeptide in a patient comprising an intracellular binding protein.

11. The composition of Claim 10 comprising an expression vector including a DNA sequence encoding said intracellular binding protein.

12. The composition of Claim 11 wherein said expression vector is selected from the group consisting of retroviral vectors, adenoviral vectors, adeno-associated viral vectors, herpesviral vectors, and naked DNA vectors.

13. A composition comprising an inhibitor capable of inhibiting the enzymatic activity of the LIPG polypeptide in a patient.

14. A composition comprising an inhibitor capable of lowering the expression of the LIPG gene in a patient.

15. A composition capable of lowering the expression of LIPG in a patient comprising a ribozyme.

16. The composition of Claim 15 comprising an expression vector including a DNA sequence encoding said ribozyme.

17. The composition of Claim 16 wherein said expression vector is selected from the group consisting of retroviral vectors, adenoviral vectors, adeno-associated viral vectors, herpesviral vectors, and naked DNA vectors.

18. The composition of Claim 14 wherein said ribozyme is a hammerhead ribozyme.

19. A composition for increasing the level of LIPG polypeptide in a patient comprising an expression vector including a DNA sequence encoding the LIPG polypeptide.

20. A composition for increasing the level of LIPG polypeptide in a patient comprising an LIPG polypeptide and a pharmaceutically acceptable carrier.

21. A composition for increasing the level of LIPG polypeptide in a patient comprising an enhancer capable of increasing the expression of the LIPG gene.

22. A composition for increasing the enzymatic activity of LIPG polypeptide in a patient comprising an enhancer which binds to and enhances the enzymatic activity of the LIPG polypeptide.

23. A method for raising the level of high density lipoprotein (HDL) cholesterol and apolipoprotein AI in a patient comprising administering to said patient a composition which lowers the enzymatic activity of LIPG in said patient.

24. The method of Claim 23 wherein said composition lowers the level of LIPG polypeptide in a patient.

25. The method of Claim 23 wherein said composition comprises an antisense nucleic acid.

26. The method of Claim 25 wherein said antisense nucleic acid is a synthetic antisense nucleic acid.

27. The method of Claim 26 wherein said antisense nucleic acid is modified to increase the chemical stability of said nucleic acid.

28. The method of Claim 23 wherein said composition comprises a neutralizing antibody capable of binding to the LIPG polypeptide and lowering its enzymatic activity.

29. The method of Claim 23 wherein said composition comprises an inhibitor which inhibits the enzymatic activity of LIPG polypeptide.

30. The method of Claim 29 wherein said inhibitor comprises a compound which lowers the expression of the LIPG gene.

31. The method of Claim 23 wherein said composition comprises a ribozyme which cleaves mRNA encoding LIPG.

32. The method of Claim 23 wherein said composition comprises a DNA molecule and a liposome.

33. The method of Claim 32 wherein said liposome is a cationic liposome.

34. The method of Claim 23 wherein said composition comprises DNA and a pharmaceutically acceptable carrier.

35. The method of Claim 23 wherein said composition comprises an expression vector.

36. The method of Claim 35 wherein said expression vector is selected from the group consisting of retroviral vectors, adenoviral vectors and adeno-associated viral vectors, herpesvirus vectors, and naked DNA vectors.

37. The method of Claim 35 wherein said expression vector includes a DNA sequence which encodes a ribozyme.

38. The method of Claim 36 wherein said expression vector is selected from the group consisting of retroviral

vectors, adenoviral vectors and adeno-associated viral vectors, herpesvirus vectors, and naked DNA vectors.

39. The method of Claim 35 wherein said expression vector includes a DNA sequence which encodes an antisense nucleic acid.

40. The method of Claim 35 wherein said expression vector includes a DNA sequence which encodes a neutralizing antibody which binds LIPG.

41. The method of Claim 35 wherein said expression vector includes a DNA sequence which encodes an intracellular binding protein which is capable of binding and neutralizing LIPG.

42. The method of Claim 41, wherein said intracellular binding protein is an antibody.

43. The method of Claim 35 wherein said expression vector includes a DNA sequence which encodes an inhibitory molecule which inhibits the enzymatic activity of LIPG.

44. The method of Claim 23 further comprising administration of a composition capable of expressing apolipoprotein AI in said patient.

45. A method for lowering the level of very low density lipoprotein (VLDL) cholesterol in a patient comprising

administering to said patient a composition capable of increasing the enzymatic activity of LIPG in said patient.

46. The method of Claim 45 wherein said composition is an LIPG polypeptide and a pharmaceutically acceptable carrier.

47. The method of Claim 46 wherein said composition is an expression vector capable of expressing an LIPG polypeptide.

48. The method of Claim 47 wherein said expression vector is selected from the group consisting of retroviral vectors, adenoviral vectors, and adeno-associated viral vectors.

49. The method of Claim 45 wherein said composition comprises an enhancer which enhances the enzymatic activity of LIPG polypeptide.

50. The method of Claim 45 wherein said composition comprises an enhancer which increases expression of the LIPG gene.

51. A method for lowering the level of low density lipoprotein (LDL) cholesterol in a patient comprising administering to said patient a composition capable of increasing the enzymatic activity of LIPG in said patient.

52. The method of Claim 51 wherein said composition is an LIPG polypeptide and a pharmaceutically acceptable carrier.

53. The method of Claim 52 wherein said composition is an expression vector capable of expressing an LIPG polypeptide.

54. The method of Claim 53 wherein said expression vector is selected from the group consisting of retroviral vectors, adenoviral vectors, and adeno-associated viral vectors.

55. The method of Claim 53 wherein said composition comprises an enhancer which enhances the enzymatic activity of LIPG polypeptide.

56. The method of Claim 53 wherein said composition comprises an enhancer which increases the expression of the LIPG gene.

57. A method for lowering the level of LDL cholesterol in a patient comprising administering to the patient an enhancer which preferentially enhances the enzymatic reactions between LIPG polypeptide and LDL cholesterol relative to the enzymatic reactions between LIPG polypeptide and HDL cholesterol and apolipoprotein AI.

58. A method for lowering the level of VLDL cholesterol in a patient comprising administering to the patient an enhancer which preferentially enhances the enzymatic reactions between LIPG polypeptide and VLDL cholesterol relative to the enzymatic reactions between LIPG polypeptide and HDL cholesterol and apolipoprotein AI.

59. A method for diagnosing a predisposition to low HDL cholesterol and apolipoprotein AI levels comprising obtaining a tissue sample from a patient and measuring the level of LIPG polypeptide in said sample.

60. The method of Claim 59 wherein said tissue is blood.

61. The method of Claim 60 wherein the level of LIPG polypeptide in said sample is measured by an immunoassay.

62. The method of Claim 59 wherein the levels of LIPG polypeptide are measured by measuring the levels of LIPG mRNA.

63. A method for determining whether a test compound can inhibit the enzymatic reaction between the LIPG polypeptide and HDL cholesterol and apolipoprotein AI comprising: (A) comparing the level of HDL cholesterol and apolipoprotein AI in a first sample comprising: (1) HDL cholesterol and apolipoprotein AI, (2) LIPG polypeptide, and (3) said test compound with the level of HDL cholesterol and

apolipoprotein AI in another sample comprising: (4) HDL cholesterol and apolipoprotein AI, and (5) LIPG polypeptide; and (B) identifying whether or not said test compound is effective in inhibiting the enzymatic reaction between the LIPG polypeptide and HDL cholesterol and apolipoprotein AI by observing whether or not the first sample has a higher level of HDL cholesterol and apolipoprotein AI than that of said other sample.

64. A method for determining whether a test compound can enhance the enzymatic reaction between the LIPG polypeptide and VLDL cholesterol comprising: (A) comparing the level of VLDL cholesterol in a first sample comprising: (1) VLDL cholesterol, (2) LIPG polypeptide, and (3) said test compound with the level of VLDL cholesterol in another sample comprising: (4) VLDL cholesterol, and (5) LIPG polypeptide; and (B) identifying whether or not said test compound is effective in enhancing the enzymatic reaction between the LIPG polypeptide and VLDL cholesterol by observing whether or not the first sample has a lower level of VLDL cholesterol than that of said other sample.

65. A method for determining whether a test compound can enhance the enzymatic reaction between the LIPG polypeptide and LDL cholesterol comprising: (A) comparing the level of LDL cholesterol in a first sample comprising: (1) LDL cholesterol, (2) LIPG polypeptide, and (3) said test compound with the level of LDL cholesterol in another sample comprising: (4) LDL cholesterol, and (5) LIPG polypeptide;

and (B) identifying whether or not said test compound is effective in enhancing the enzymatic reaction between the LIPG polypeptide and LDL cholesterol by observing whether or not the first sample has a lower level of LDL cholesterol than that of said other sample.